

REMARKS

The application has been reviewed and revised in light of the Office Action mailed on June 14, 2005. Claims 1-20 are currently pending in the application, with Claims 1, 13 and 19 being in independent form. By this amendment, Claims 1 and 13 have been amended and Claims 7-12 have been withdrawn. In view of the amendments above and the remarks to follow, reconsideration and allowance of this application are respectfully requested.

Election/Restriction

Claims 7-12 were withdrawn from consideration. It is respectfully submitted that the withdrawal from consideration of Claims 7-12 is improper. All of the claims now appearing in this application should be examined at this time because the system recited by Claims 7-12 is analogous to the method and system recited by Claims 1-6 and 13-20. Applicants respectfully submit that there would be no hardship or extra burden in examining all of the claims presented in this application. Accordingly, reinstatement of the withdrawn claims and examination of all claims presented in this application are respectfully requested.

If examination of the application continues solely with respect to Claims 1-6 and 13-20, Applicants retain the right to present Claims 7-12 in one or more separate divisional applications pursuant to 35 U.S.C. § 121.

Rejection of Claims 1 and 13 under 35 U.S.C. § 112

Claims 1 and 13 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as the invention. Claims 1 and 13 have been amended to include “comparing the determined crystal diameter with a predetermined crystal diameter value stored in a memory to determine a discrepancy value.” (Emphasis added). The subject matter of amended Claims 1

and 13 is believed to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1-6 and 13-20 Under 35 U.S.C. § 103

Claims 1-6 and 13-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Cope (U.S. Pat. No. 3,761,692) and further in view of Azad (U.S. Pat. No. 5,132,091).

Cope is directed to an automated crystal pulling system utilizing a digital computer to control a Czochralski crystal puller. The automated crystal pulling system includes block 27 having associated motors, tachometers, sensors and transducers; and digital computer 13 communicating with block 27 via D/A and A/D converters 25 and 23. The automated crystal pulling system further includes a manual control panel 29 for enabling direct manual control of the crystal puller when the direct digital control mode is not being utilized. Column 3, lines 1-51. The control system for controlling the crystal pulling process comprises control algorithms, monitors and controllers and a conventional induction heated Czochralski crystal puller. Column 4, lines 13-19. The temperature control algorithm receives an input from a melt temperature sensor and calculates the set point to a generator controller. A diameter control algorithm receives an input from a crystal diameter sensor and calculates the set point to a crystal pull motor controller. A melt level control algorithm calculates the set point to a crucible lift motor controller to provide a constant melt level. See Abstract.

It is respectfully submitted that the present invention as claimed is patentably distinct from Cope. Even though Cope describes a Czochralski apparatus, Cope does not disclose or suggest comparing the determined crystal diameter with a predetermined crystal

diameter value stored in a memory to determine a discrepancy value, as recited by Applicants' independent claims.

In particular, with respect to independent Claim 1, Cope does not disclose or suggest "A method for controlling a melt temperature of a crystal-growing apparatus comprising determining a crystal diameter of a crystal being grown by the crystal-growing apparatus; comparing the determined crystal diameter with a predetermined crystal diameter value stored in a memory to determine a discrepancy value; correlating the discrepancy value with the following parameters: a direction that the melt temperature must be adjusted and an amount the melt temperature needs to be adjusted; transmitting the parameters to a pulse generator for using the parameters to generate pulses having a polarity which indicates whether the melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and transmitting the generated pulses to at least one input terminal of a temperature controller for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses," as recited by Applicants' Claim 1. (Emphasis added)

In contrast, the automated crystal pulling system described in Cope, although describing a crystal puller of the Czochralski type, it does not compare the determined crystal diameter with a predetermined crystal diameter value stored in a memory to determine a discrepancy value. Accordingly, independent Claim 1 is believed to be patentably distinct over Cope.

With respect to independent Claim 19, Cope does not disclose or suggest "A process control system for controlling a melt temperature of a crystal-growing apparatus comprising: a pulse generator for generating pulses having a polarity which indicates whether the

melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and a temperature controller having at least one input terminal for receiving the generated pulses and for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses,” as recited by Applicants’ Claim 19. (Emphasis added).

It is respectfully submitted that Azad does not cure the deficiencies of Cope. Azad is directed to an apparatus and method employing a radiative heater for control of a shape of a peripheral edge region of a solidification interface in a Czochralski crystal pulling process. Azad includes an external heater 17 for controlling the bulk thermal conditions of the melt, including keeping the bulk temperature of the melt at a predetermined level. Column 4, lines 61-64.

Azad does not discuss or suggest a method for controlling a melt temperature of a crystal-growing apparatus comprising “comparing the determined crystal diameter with a predetermined crystal diameter value stored in a memory to determine a discrepancy value,” as recited by Applicants’ independent Claim 1. Azad also does not disclose or suggest “a pulse generator for generating pulses having a polarity which indicates whether the melt temperature is to be increased or decreased,” as recited by Applicants’ independent Claim 19. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested and allowance of independent Claims 1 and 19 is earnestly solicited.

With respect to independent Claim 13, it is respectfully submitted that Claim 13 includes similar limitations as independent Claim 1. Therefore, for at least the same reasons given above for independent Claim 1, it is respectfully submitted that independent Claim 13 is

also believed to be patentable over Cope. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested and allowance of the independent claims is earnestly solicited.

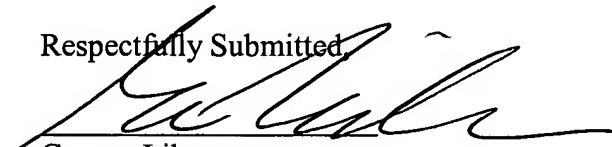
Dependent Claims 2-16 and 13-18 and 20 depend directly or indirectly from independent Claims 1, 13 and 19, and are therefore patentable for at least the reasons given above for independent Claims 1, 13 and 19. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested and allowance of the dependent claims is earnestly solicited.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that none of the references of record, considered individually or in combination, in whole or in part, disclose or suggest the claimed subject matter. Therefore, all claims now pending in this application, namely, Claims 1-6 and 13-20, are now in condition for allowance. Accordingly, early and favorable consideration of this application is respectfully requested.

Should the Examiner believe that a telephone or personal interview may facilitate resolution of any remaining matters, she is respectfully requested to contact Applicants' undersigned attorney at the telephone number indicated below.

Respectfully Submitted,



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